

## CLAIMS:

1. A distributed power supply arrangement comprising a plurality of power sources for supplying power to a plurality of loads via a power distribution network, the power sources  
5 and the loads being connected to the power distribution network whereby the power sources are coupled to the loads via respective resistances of the power distribution network, the arrangement further comprising at least one voltage sensor for sensing voltage at at least one point in the power distribution  
10 network, wherein each of the power sources is responsive to the sensed voltage for supplying a regulated current or a regulated power to the power distribution network.
2. An arrangement as claimed in claim 1 and comprising a plurality of said voltage sensors for sensing voltages at a  
15 plurality of points in the power distribution network.
3. An arrangement as claimed in claim 2 wherein each of the power sources is responsive to an average of the sensed voltages for supplying said regulated current or regulated power to the power distribution network.
- 20 4. An arrangement as claimed in claim 1 wherein the power sources comprise regulated current sources.
5. An arrangement as claimed in claim 4 wherein the power sources are arranged for supplying regulated currents to the power distribution network with different relative weights.
- 25 6. An arrangement as claimed in claim 1 wherein the power distribution network comprises power and ground planes of a circuit card on which the loads are provided.

7. An arrangement as claimed in claim 6 wherein the plurality of power sources are arranged on the circuit card.

8. An arrangement as claimed in claim 1 wherein the power sources comprise switch mode power converters, the arrangement further including a control unit for controlling the power sources to operate in synchronism with different phases.

9. A method of regulating voltage in a power distribution network including a plurality of power sources for supplying power to a plurality of loads, comprising the steps of:

sensing voltage at at least one point in the power distribution network; and

regulating currents supplied by the plurality of power sources to the power distribution network in dependence upon the sensed voltage.

10. A method as claimed in claim 9 wherein the voltage is sensed at a plurality of points in the power distribution network, and the currents supplied by the plurality of power sources are regulated in dependence upon an average of the sensed voltages.

11. A method as claimed in claim 10 wherein the currents supplied by the plurality of power sources are regulated to have different relative weights.

12. A method as claimed in claim 9 wherein the power sources comprise switch mode power converters, the method further including the step of controlling the power sources to operate in synchronism with different phases.

13. A method as claimed in claim 9 applied to a circuit card, wherein the loads comprise integrated circuits on the circuit card and the plurality of power sources comprise switch mode power converters on the circuit card.

5 14. A method as claimed in claim 13 wherein the power distribution network comprises power and ground planes of the circuit card.

15. A power supply arrangement comprising a plurality of power sources each arranged for supplying power via a power  
10 distribution network to each of a plurality of loads, and at least one sensor for sensing a parameter of the arrangement for regulating the power supplied to the power distribution network from the plurality of power sources.

16. A power supply arrangement as claimed in claim 15  
15 wherein the power sources comprise regulated current sources.

17. A power supply arrangement as claimed in claim 15 wherein each sensor comprises a voltage sensor for sensing voltage at a respective point in the power distribution network.

20 18. A power supply arrangement as claimed in claim 15 wherein said parameter comprises a temperature at a respective point in the power distribution network.

19. A power supply arrangement as claimed in claim 15 and comprising a plurality of said sensors each for sensing said  
25 parameter at a respective one of a plurality of points in the power distribution network.

20. A power supply arrangement as claimed in claim 15 wherein the power sources comprise fluid sources and the loads comprise fluid drains.